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ABSTRACT

Thirty-six abstracts of media research presented at the 1975 convention of the Association for Educational Communications and Technology (AECT) are compiled in the order in which the papers were presented. Each abstract includes name, affiliations and mailing address of the person presenting the paper. Most abstracts are organized according to purpose, rationale, procedure, results, and conclusions. (SK)

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AECT Research Abstracts

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Specializing in Materials and Strategies for Learning

April, 1975

ERIC AT STANFORD is pleased once more to be able to cooperate with the AECT Research Committee and Francis M. Dwyer in making available these abstracts for distribution at the AECT Annual Convention.

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The research abstracts are listed in the order in which the papers are to be presented.

Lewis B. Mayhew

Lewis B. Mayhew
Clearinghouse Director

Research Abstracts

1975

1. Robert Heinich, "An Analysis of Systemic Barriers to Educational Technology and Instructional Productivity"
2. Perrin E. Parkhurst, "Student's I.Q. Level and Performance in Self-Paced Instruction"
3. Ann De Vaney Becker, "Verbal Ability and Visual Verbal Modes of Presentation in the Acquisition of Metaphor"
4. Charles E. Nelson, "An Experimental Study Using College Students, Comparing Forms of Audio and Visual Instruction With Forms of Feedback in Group Paced Programmed Instructional Sequences"
5. Francis M. Dwyer, "Effect of Students' I.Q. on Visualized Instruction"
6. Arni T. Dunathan, James Masterson, Gary Parks, and Ken Tharpe, "Effects of Motion Picture Compression on Psychomotor Performance"
7. Robert Burdman, "Intermittent Feedback Schedules in Videotaped Programmed Instruction"
8. Lawrence E. Fraley and Ernest A. Vargas, "Multivariable Implications of an Instructional Innovation"
9. Frank A. Viggiano, Jr., "A Study of Various Educational Media Personnel and Their Practices Regarding the Reproduction of Copyrighted Works"
10. Thomas Sandusky, "Instructional Rate: An Effective Measure for Individualized Instructional Systems"
11. Barbara B. Braverman and O. Dennis Barnes, "Systematic Program Development for Urban Related Projects"
12. Richard J. Lamberski, "An Exploratory Study in Maximizing Retention by Utilizing Black/White and Color Coding in Visualized Instruction"
13. Meredith W. Watts and David Sum., When Children View Televised Violence: Some Effects on Attitudes and Emotions"
14. Floyd B. Ausburn, "A Comprison of Multiple and Linear Image Presentations of a Comparative Visual Location Task to Visual and Haptic College Students"
15. Bernard Fradkin and Joshua Meyrowitz, "Design of Multi-Image Instructional Presentations"
16. David E. Hooten and Richard D. Zakia, "Guided Individual Study Using Television"
17. Gene L. Wilkinson, "The Effects of Projection Variables on Performance in a Visual Discrimination Task"
18. Lynna J. Ausburn, "The Relationship of Perceptual Type to Perceptual Style and Tempo in College Students"
19. Dean R. Spitzer, "The Effect of Group Discussion on Educational Risk Taking"
20. Marjorie E. Hoachlander, "Book-In-Motion/Book-In-Print"
21. Richard L. Daughenbaugh, "Some Effects of First and Second Editions and Utilization Procedures of a Film on Learning and Attitudes of Certain Seventh Grade Students"
22. David Giltrow, Lawrence Hecht, and Michael Katims, "More Than Meets the Eye: Discrepancies in Cognitive and Affective Adult Students' Responses to Two Television Production Styles"
23. Jacob John Fisher and Mary Patricia Robertson, "The Development of Mass-Media Programs at Bergen Community College--An Analysis of Methodology and Instructional Development"
24. Henry C. Dequin, "The Effect on Achievement as Influenced by the Relationship Between the Individual's Cognitive Style and Instructional Mode"

25. Vernon S. Gerlach and Brian D. Shipley, "The Effect of Instructional Cues on Non-Verbal Learning"

26. Jack H. Bond, "Measuring Program Acceptance"

27. Louis H. Berry, "An Investigation of the Effectiveness of Realistic and Non-Realistic Color in Visualized Instruction"

28. Richard J. Rosonke, "A Study of the Effectiveness of Three Visual Attention-Directing Devices on the Recall of Relevant Information from Line Drawings"

29. John W. Eads, "Student Performance in a Modularized Human Anatomy and Physiology Course"

30. Robert A. Reiser, "The Effects of Instruction and Practice in an Effective Instructional Program"

31. John M. Keller, "Determinants of Learned Helplessness in Problem Solving"

32. Yves Lauzon and Richard Rancourt, "An Existential Approach to Multi-Media Programming: A Pilot Project in Continuing Education"

33. Vincent Artale, Subramaniam Kandaswamy, Harold Stolovitch, and Sivasailam Thiagarajan, "Effects of a Roleplay/Game on Players' Attitudes Toward Instructional Games"

34. Lee DeNike, "An Exploratory Study of Cognitive Style as a Predictor of Learning from Simulation Games"

35. Arni T. Dunathan, "Effects of Narrator Sex on Perception of Autokinetic Movement"

36. James P. Kielt, "College Physics: An Instructional Development Treatment"

AN ANALYSIS OF SYSTEMIC BARRIERS TO EDUCATIONAL TECHNOLOGY AND INSTRUCTIONAL PRODUCTIVITY

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This study is an analysis of how various aspects of the laws, regulations, practices and policies in the governance of education inhibit the introduction of technologically-based systems, and, as a result, prevent attempts to increase instructional productivity.

The thesis was posited that technologically-based instruction in its comprehensive forms competes with, rather than is complementary to, traditional instructional practice. Because of the laws, regulations, practices, and policies (the superstructure) of the governance of education evolved in reference to (and in support of) classroom teachers as the base of the educational system, efforts to establish a new instructional base (technologically-based instruction) are defeated by the current superstructure. Regulations and laws designed to assure quality of instruction now act as inhibitors to increasing instructional productivity through educational technology.

The study examined key areas of the governance of education to determine the kinds of changes needed in order to facilitate large-scale use of educational technology and alternative instructional modes. Certification and accreditation practices, state aid formulas, state department of education policies, and negotiated contracts were the areas to be examined.

The study was limited to a search of the literature for examples of restrictive laws and practices. The pattern of control by law and regulation was seen to be an interlocking set of key elements that have been shifting in emphasis. State aid to schools is becoming less a factor due to state finance reorganization in the wake of Serrano, Rodriguez, and other decisions. However, certification requirements are increasing in importance due primarily to increased pressure from teacher associations and unions. In general, the present pattern of laws and regulations does inhibit the ways in which school districts can deploy educational resources.

Recommendations for further research emphasize the gathering of data directly from state departments and devising alternative legal structures.

STUDENT'S I.Q. LEVEL AND PERFORMANCE IN SELF-PACED INSTRUCTION

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Purpose

This study was designed to investigate the most effective combination of selected instructional strategy variables for students who differed in level of I.Q.

Independent variables were: 1) a method of presentation variable; 2) a visual realism variable; and 3) an individual difference variable. The dependent variable was performance on five criterion tests, each designed to simulate a different level of educational task.

Rationale

It is widely held by most practitioners that when designers of mediated instructional courseware are assembling that combination of media which they believe to be effective, little attention is given to decision making based on empirical evidence. Few agencies, actually engaged in instructional development activities, have any sound empirical data upon which to develop instructional materials for students, while taking the following into account: 1) individual differences, 2) type or level of educational task, 3) particular method of presenting the content information (strategy for mediating what is to be learned).

Given the problem of how to select the "best" instructional alternative for a particular student, it should become obvious that one must consider at least two design factors; a) the characteristics (cognitive or affective) of that student and b) the characteristics of the instructional alternatives. Instruction must be adapted to accommodate student differences rather than *vice versa*.

Procedures

A 3 x 4 x 3 factorial design with 5 levels of a repeated measure was used. In Lindquist's (1953) notation, it may be represented as: RS_n in $[A_3 @ B_4 @ C_3] @ J_5$.

The three levels of factor A (method of presentation variable) were: 1) programmed booklets with periodic review questions and answers after approximately every 10 frames; 2) same as level 1 plus additional questions and answers after each frame; and 3) same as level 2 plus all printed instructional material being simultaneously presented on audiotape.

The four levels of factor B (visual realism variable) were: 1) no visuals; 2) line drawings; 3) detailed shaded drawings; and 4) realistic pictures of the object.

The three [illegible] (individual difference variable) were: 1) high; 2) medium; and

[illegible] the repeated measure (criterion tests) were: 1) a drawing test; 2) an identi-[illegible]inology test; 4) a comprehension test; and 5) a total criterion score (above four tests combined). All criterion scores were standardized to a "T" score; i.e., a $\bar{X}$ of 50 and a s.d. of 10, prior to entering them into the ANOVA.

Ss (300) were students enrolled in a basic Instructional Media course in the college of education at The Pennsylvania State University. They were given the Otis Quick Scoring Mental Ability Test (Form Fm) and then randomly assigned to treatment levels of factors A and B. A *post hoc* randomization procedure was used on the individual difference variable (I.Q.). Cells were adjusted to attain proportionality. Analysis of variance was conducted on both the immediate and a 4 week delayed posttest

Results

Of the 15 F-ratios tested, the following results were obtained; on the immediate posttest, four were significant–2 had $p<.05$ and 2 had $p<.01$; on the delayed posttest, five were significant – 1 had $p<.05$ and 4 had $p<.01$.

Conclusion

For immediate posttest results, the statistical interaction between all four factors: A (method of presentation), B (visual realism), C (I.Q.), and J (criterion measures) was significant ($p<.05$). This interaction indicates that the effect of combining factors A, B, and J in an instructional setting is *not* the same for students who differ in their level of I.Q.

For delayed posttest results, again the 4 factor statistical interaction was significant ($p<.01$). The same conclusion as above was reached.

The occurrence of a significant interaction at the conclusion of a 4 week time period is a phenomenon seldom reported in similar studies. It would seem to have relevance for individuals interested in examining instructional alternatives which best facilitate delayed retention for students who differ with respect to level of I.Q.

VERBAL ABILITY AND VISUAL VERBAL MODES OF PRESENTATION IN THE ACQUISITION OF METAPHOR

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The purpose of this study was to investigate the interaction between verbal ability and visual verbal modes of presentation.

The problem under investigation posed the following questions: (1) Which medium (print, print/still pictures, sound, sound/still pictures) has the unique capability of presenting a specific instructional task (concept learning) to a learner of a given verbal ability (high, medium, low)? (2) Which of the given media is most effective in the retention of a poetic concept by students of high, medium, or low verbal ability? (3) How will evidence gathered from this experiment relate to design of instructional material? (4) How will evidence gathered from this experiment relate to the teaching of a poetic concept, metaphor.

Specific hypotheses investigated the differential effects of the presentation modes, differential effects of verbal ability, the interaction itself, and the mode under which high verbal ability students performed best.

A random stratified sample of 108 subjects was drawn from a pool of 387 ninth and tenth graders at Canyon High School, Newhal, California. The strata were high, medium, and low verbal ability as indicated on the Sequential Test of Educational Progress. An experiment was conducted in which four visual verbal modes of presentation (print, print/still pictures, sound, sound/still pictures) carried the information to subjects. The information was instruction in the poetic concept, metaphor. A posttest only design based on a two-way analysis of variance was used.

Results indicated that there was an overall tendency for the sound/still picture treatment to be the most effective mode of presentation of the four in the teaching of metaphor. The sound/still picture presentation aided low verbal ability students in the comprehension and retention of metaphor Sound/still picture presentation aided low verbal ability students more than sound alone in the acquisition of metaphor.

Abstract 4

AN EXPERIMENTAL STUDY USING COLLEGE STUDENTS, COMPARING FORMS OF AUDIO AND VISUAL INSTRUCTION WITH FORMS OF FEEDBACK IN GROUP PACED PROGRAMMED INSTRUCTIONAL SEQUENCES

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The purpose of this study is to investigate the effectiveness of three variables in machine-mediated small group instruction. The following questions are being considered in working toward the final conclusion:

1. Which supportive visual media works best with audio based instruction–printed materials, slides or television?
2. What are the effects of the three forms of media on the acquisition of facts, concepts and skills?
3. What form of feedback is best for an incorrect answer, or revealing the correct answer with additional information?

The project is also concerned with the production of the appropriate materials. The instructional sequences have been designed using progressive steps of information interspersed with question/response items. Presently the instructional sequences are in the area of audiovisual equipment operation and audio processes in learning.

The sample is composed of upper division college students who are enrolled in the general survey course of the Instructional Technology Department at Southern Illinois University, Edwardsville. Subjects are divided into groups of fifteen. Each group is tested in all three areas of one of the variables while the other two variables are held constant. This is done by using three separate lessons.

This is a three-year research project divided into three phases. The first phase consists of the production of materials which are programmed and produced in slide/tape, videotape, and printed booklet forms. The second phase consists of the establishment of a learning laboratory which will house the necessary equipment. A specially designed responder system is employed which is electronically synchronized with the media presentations. This is intended to continue for at least one year. The third and final phase is the analysis of the data and publication of results.

Abstract 5

EFFECT OF STUDENTS' I.Q. ON VISUALIZED INSTRUCTION

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This experiment was designed to determine whether (a) Ss' I. Q. level affects their achievement on criterial tests designed to measure their achievement of different educational objectives, (b) identical visuals are equally effective in facilitating the achievement of Ss possessing different I. Q. levels; (c) the use of specific types of visuals can be used to reduce the differential effects attributed to different I. Q. levels on criterial tests designed to measure student achievement of different educational objectives, and (d) all types of visuals are equally effective in facilitating achievement of identical educational objectives by Ss possessing different I. Q. levels. Seven hundred seventy-six Ss at The Pennsylvania State University were randomly assigned to one of the nine treatment groups. Each S received a pretest, participated in his respective instructional presentation, and received four individual criterial measures. The three levels of I. Q.—high, medium, and low—were defined by establishing cut-off points one-half standard deviation on each side of the mean achieved by Ss in each of the nine instructional treatments on the Otis Quick Scoring Mental Maturity Test (Form Fm).

The results of this study indicate that (a) Ss in the high I. Q. level consistently achieved equivalent or significantly higher scores on the criterial measures than Ss in low and medium I. Q. levels regardless of the type of instructional presentation they received; (b) the use of visualization to complement oral instruction is an effective instructional technique for reducing differences in achievement on the criterial measures between Ss in the medium and low I. Q. levels, and (c) all types of visual illustrations are not equally effective in facilitating S achievement of different educational objectives for Ss in the different I. Q. levels.

Abstract 6

EFFECTS OF MOTION PICTURE COMPRESSION ON PSYCHOMOTOR PERFORMANCE

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Introduction

One promising technique for reducing both instructional stimulus and learner response time without a significant reduction in acquisition is compressed speech.

Visuals: print, pictures or slides, used in conjunction with compressed speech increase comprehension (Woodcock and Clark, 1968 and 1969; Watts, 1969; Bruland, 1970; Parker, 1970; Benz, 1971).

Parker (1972) tested uncompressed and compressed (ten percent, 12½ percent and 16 2/3 percent) versions of a 16mm film and concluded that those compressions had little or no effect upon information recalled.

Problem

Remaining uninvestigated are audio/visual compressions in excess of 16.5 percent. The spread of compressions investigated in this study was 0, 25, 33 1/3, and 50 percent.

Both immediate and delayed measures of psychomotor performance-quality and time-to-solution were made. Subjects were grouped by sex and perceptual speed ability.

Hypotheses

There are no significant immediate or delayed mean performance-quality or performance-time scores of Ss by sex or perceptual speed ability exposed to selected compressions of an instructional sound picture.

Design

Design was 4 (film compressions) by 2 (perceptual speed ability) by 2 (sex). Analysis was by three-way ANOVA.

Experimental Task

After exposure to film treatment, Ss built a simple wood boat following film instructions, procedures, materials, and tools.

Subjects

Forty-eight sixth-grade pupils were randomly assigned to treatment by sex and perceptual speed ability.

Materials

An original four minute and ten second Super 8mm color film was compressed by rephotography from a rear screen. Audio (158 word per minute) tape was compressed to rates of 25, 33 1/3, and 50 percent at the Center for Rate Controlled Recordings, University of Louisville. Film and tape were than reassembled as compressed motion sound pictures.

Procedures

Ss reported to the viewing room in groups of 4 where stimulus was administered via a rear screen projector with individually controlled volume earphones from a tape player. After treatment, Ss entered the workshop and set to work. Raters recorded performance-quality and time-to-solution.

Results

Three-way ANOVA revealed no significant main effects for immediate measures of performance-quality.

Significant differences (.05) were recorded for immediate performance-time scores by compression (A), perceptual speed ability (B), and sex (C).

Duncan's New Multiple Range Test identified the 50 percent compression as the significant source of variance among treatments.

Highly significant (.01) differences in 12-day delayed scores by perceptual speed ability (B) and sex (C) for both dependent measures are attained.

Differences on both delayed dependent measures generally favored male Ss and Ss of high perceptual speed ability.

Three significant (.01, .05, .05 respectively) interactions were identified.

Discussion

The data suggest that Ss may have been attempting to model their work rate after the rate of film presentation.

This pattern does not persist after the 12-day delay suggesting that after the initial attempt, learners return on succeeding attempts to a work rate based upon individual habit.

An extension of this hypothesis would suggest that differences observed in this experiment could be attributed more to the effects of artificially induced work rates than to the ability of Ss to comprehend the instructional message.

Conclusions

1. Instructional sound motion pictures can be compressed at rates not in excess of 50 percent without significantly affecting performance-quality in a psychomotor task.

2. Instructional sound motion pictures compressed at a rate of 50 percent have a significantly negative effect upon performance-time in a psychomotor task attempted immediately following treatment and exert a greater effect upon females than males and Ss of low perceptual speed than high perceptual speed.

3. The negative treatment effect of 50 percent compressions on performance-time is not significantly maintained after a 12-day delay.

Abstract 7

INTERMITTENT FEEDBACK SCHEDULES IN VIDEOTAPED PROGRAMMED INSTRUCTION

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Purpose

The purpose of the study was to determine the effect of intermittent information feedback schedules on content error rate, recall and retention of videotaped programmed materials viewed under group-paced conditions.

Rationale

Although principles of programmed learning have been applied to many instructional television productions since the early sixties, empirical data have been obtained primarily for programmed videotapes with constant information feedback. The literature strongly indicates that within programmed instruction it is not clear at this time whether, or under what conditions, constant or intermittent information feedback is useful.

The research on programmed instructional television products has dealt with continuous information feedback; and "no feedback" conditions; no intermittent information feedback schedules have been empirically tested by investigators in the instructional television area.

Procedures

Data yielding subjects were 32 undergraduate college students who volunteered for the study Two independent variables, with four levels each, were identified: intermittent information feedback schedules and programmed units. The four levels of the feedback schedule variable were: FR2; VR2; FR3; and VR3. The four levels of the programmed units variable provided the content for the videotapes; sections number six, seven, eight, and nine of *The Analysis of Behavior*, by B. F. Skinner and J. G. Holland (McGraw-Hill, N.Y., 1961) were selected for this purpose. The task frames, with all prompts removed, were used as test materials. A counterbalanced, 4 x 4 fixed factorial design was selected for the study. The subjects were randomly assigned to four experimental groups. The subjects were measured on the criterion variable (error rate) while viewing the videotapes, immediately after viewing the videotapes, and on the seventh day after treatment. F statistics were calculated to test for significant differences at the 0.05 level.

Results

Intermittent information feedback schedule effects were not significant at the levels tested, the trends observed indicated lower error rates for the variable schedules. Interaction between the feedback schedules and the program content was not significant.

Conclusions

The results suggest that the program content may be operating as a feedback mode; error rates may be primarily influenced by the program structure and content, rather than by the feedback available through schedules. Discounting the differences between self-paced and group-paced mediated programmed learning, this study supports the idea that externally manipulated feedback has little influence, if any, on error rate, recall and retention of videotaped programmed materials.

The developer of instructional television products utilizing programmed materials, or a programmed format in the production, should attempt to obtain intrinsic feedback from the program content through testing and revision of the materials used, since the use of extrinsic intermittent feedback schedules does not seem to depress error rates. Curtailment in the use of such schedules in favor of the inclusion of clues guiding the learner to the critical parts of the program, and expanded contents are suggested.

Abstract 8

MULTIVARIABLE IMPLICATIONS OF AN INSTRUCTIONAL INNOVATION

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In complex instructional systems an innovation in the instructional technology, undertaken to solve a particular problem, may have far reaching and unanticipated effects relative to other variables. For example, something done to save the system some money may do so but may also increase the time required of the students or decrease the amount of learning that occurs. This study examined the effects on other critical instructional variables resulting from a prior innovation which successfully reduced the amount of tutoring necessary within an instructional system.

Two groups of students were compared, one from before the innovation was introduced and one making use of it; the groups were matched according to both reading skill and prior knowledge of the instructional materials. The matched groups were then compared to determine if the innovation, successful in cutting the necessary tutoring in half, had resulted in unforeseen changes in the time efficiency of the learning.

It was found that there was a trend toward degradation of the learning per unit of study time, but it was not statistically significant. The study showed that while there may have been some loss of instructional quality along the learning rate dimension, it was not sufficient to justify the withdrawal of the prior innovation, although further study was indicated. This study is important because it is one of very few studies which have reexamined the latent implications of an apparently successful system innovation. A surprising result was that an innovation which so successfully affected one variable, did not produce correspondingly advantageous effects along other critical dimensions of instructional quality.

Abstract 9

A STUDY OF VARIOUS EDUCATIONAL MEDIA PERSONNEL AND THEIR PRACTICES REGARDING THE REPRODUCTION OF COPYRIGHTED WORKS

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Current copyright laws do not clearly define what an educator can or cannot do in regards to the duplication of copyrighted materials.

The purpose of this study was to ascertain what educational media personnel (those who have access to copyrighted works and advanced copying equipment) were actually "copying" in their work experiences. Their copying policies would offer evidence of current practices which would hopefully lead to revision of an antiquated law. This study was not concerned with possible revision attempts; but instead, it surveyed current practices and the extent of probable violations.

Prior to the distribution of an opinionnaire the author reviewed copyright principles and technology, historical background, court decisions and infringement versus fair use.

An opinionnaire was distributed at the Ninth Annual Educational Media and Technology Conference, July 22-24, 1974, at the University of Wisconsin-Stout, Menomonie, Wisconsin. The instrument consisted of 24 hypothetical situations representing circumstances that may arise in the actual work experience of educational media personnel. The population studied included: 1) Learning Resource Directors, 2) Media Directors, 3) Library Directors, 4) Media Coordinators, 5) Librarians, 6) Media Specialists, 7) A-V Specialists, 8) Consultants, 9) Teachers, 10) A-V Graduate Students, 11) Salesmen and 12) Others including library and media aides, communication technicians and specialists.

The participants were to assume that there was no special duplicating permission granted and that the source materials were copyrighted. The 24 hypothetical situations pertained to the reproduction of 1) films, 2) film strips, 3) video tapes, 4) record albums, 5) audio tapes, 6) slide/tapes and 7) printed matter.

Analysis of Data

Completed opinionnaires were programmed into a computer at the Center for Research and Educational Improvement at the University of Wisconsin-Stout. Tables were organized to reveal: a) the responses to each situation by the entire population and b) the responses of the twelve occupational groups to the seven specific types of media represented in the study.

Who was infringing and to what degree was revealed in the study.

1) Reproduction would have occurred in a majority of the situations. The participants were more likely to duplicate copyrighted materials than not.

2) Learning Resource Directors were apt to reproduce copyrighted materials of all types more readily than any other of the groups studied. (49.6% of Learning Resource Directors responded "Yes" while only 9.7% of Salesmen answered "Yes" to duplicating various types of media.)

3) Library Directors and Salesmen, the two smaller groups, were least likely to permit duplication of copyrighted materials. (Eighty per cent of both groups responded "No" to the duplication of slide/tapes.)

4) The media most frequently copied were audio tapes while films and slide/tapes were the least copied.

Insight into the treatment of copyrighted works by educational media personnel has been made. What next?

Abstract 10

INSTRUCTIONAL RATE: AN EFFECTIVE MEASURE FOR INDIVIDUALIZED INSTRUCTIONAL SYSTEMS

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This study proposes the use of Instruction Rate as an effective measure for independent or individualized instructional systems, in that it reinforces the student's achievement independent of the teacher and aids in the management of learning experiences.

Instructional Rate is defined as criteria points over elapsed time. The criteria points are achieved when the student attains criteria on specified weighted objectives. These points are then placed over the time it took the student to master the objective.

The subjects were forty-five seventh grade students of an inner-city school. The same instructional process was used for each of the three treatments used in the study. During treatment one, a conventional percentage grading system was used. The rate a student could proceed through the unit was fixed. A criteria point evaluation system was used for treatment two. The rate, again was fixed. Treatment three consisted of the same criteria point evaluation system, only the student could proceed through the unit on an independent basis. The experimental design used was a two factor analysis of variance mixed design with fifteen subjects nested in three organismic variables (reading ability levels) and crossed with the three treatments.

The results indicated that the high and middle ability students significantly achieved better when criteria points were used instead of a conventional percentage grading system. Low ability students significantly achieved better when criteria points were attained on an independent basis.

Achievement significantly increased because the use of Instructional Rate, as an evaluative measure, allowed the student to record his or her progress without the teacher being involved. And the criteria points specified exactly how much the student had to do in order to attain various levels of achievement. The use of Instructional Rate aided the teacher in the management of learning experiences because it freed the teacher from time consuming grading tasks and allowed him or her to check the progress of individual students at any time during the instructional system.

Abstract 11

SYSTEMATIC PROGRAM DEVELOPMENT FOR URBAN RELATED PROJECTS

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Purpose

The Urbanarium is a unique program supported by the Kellogg Foundation located at the Rochester Institute of Technology. It is basically concerned with the relationship between an educational institution and business, industry, and community groups. It encourages involvement of community members in the educational setting both as learners and adjunct faculty in a variety of learning formats which attempt to meet community needs and enhance educational advancement of participants. The Urbanarium systematically identifies programs with the greatest probable impact on both community and participants. For example, a Land Use Seminar was co-sponsored by the Urbanarium, Junior League, and Council for Environmental Information. Project teams composed of community and educational leaders need help in development and evaluation of programs. This paper describes an attempt to train project teams in systematic program development and evaluation.

Rationale

The Urbanarium has assumed responsibility for helping project teams involved in program planning to specify objectives, determine appropriate strategies and evaluate effectiveness of programs. In order to meet the need for training of project teams in this area, a two-day workshop was developed in systematic program development and evaluation.

Procedures

The workshop consisted of five sections:

1. A pre-workshop questionnaire which would identify the problem area for project teams for (1) sensitization to content area and (2) development of problems for workshop activities.
2. An overview of the systems approach to problem solving, with emphasis on specification of objectives and evaluation.
3. An experience in objective writing and evaluation design related to programs in which the project teams are involved.
4. Design of an evaluation scheme and plans for its completion for a specific program for which the project team is responsible.
5. A follow-up planned for each project team depending on the progress of the teams during the workshop, which includes program planning activities through data analysis and reporting.

Results

Formative and summative evaluation procedures have been established for the workshop itself. The quality of the products will be rated on predetermined criteria related to objectives, procedures for evaluation and data analysis. Evaluation of various components of the workshop will be conducted regarding acquisition of cognitive skills and changes in affective behavior. Effectiveness of various components of the workshop itself will be rated.

Abstract 12

AN EXPLORATORY STUDY IN MAXIMIZING RETENTION BY UTILIZING BLACK/WHITE AND COLOR CODING IN VISUALIZED INSTRUCTION

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Purpose

The purpose of this exploratory study was: (a) to measure the relative effectiveness of two types of cueing (color & black/white) found in simple line drawings on immediate and delayed tests, (b) to determine whether the two different types of cueing are equally effective in facilitating student achievement on different educational tasks, (c) to determine whether student achievement is effected by altering a conditioned visual cueing pattern for different educational tasks, (d) to determine the relative retentional value of two types of cueing.

Rationale

An extensive three year search of the literature has revealed several tenable hypotheses on the cognitive and affective value of cueing in visualized instruction; particularly in the use of color & black/white as cueing techniques.

This exploratory study reflects one in a series investigating students' ability to process, store, and retrieve instruction complemented by visualization. Such a series of investigations attempt to maximize retention of cognitive skills while attaining a desirable affective outcome.

Procedures

Two sets of presentation and evaluation audio/slide materials were developed to be the same in narrative and visual content, yet varying on the independent visual variable of cueing technique: color or black/white. Inherent to the presentation materials were simple line drawings developed to complement the audiotaped instruction; while five evaluative measures were developed to assess student achievement of different low cognitive skills presented in the instruction. Key to the procedure was the utilization of the same visual cueing technique in the presentation and evaluation materials.

One hundred and fifty-two college students were randomly assigned to treatment conditions. Each student received a mental ability test, interacted with the instructional presentation, and completed an immediate and two week delayed test on the five evaluative meaures.

Results

Immediate Analysis. Multiple Behrens-Fisher t-tests on the five evaluative measures indicated that significant differences existed in three out of five immediate measures.

Delayed Analysis. An analysis of variance conducted on the scores achieved on the evaluative measures indicated that no significant differences existed on the five measures.

Retention Analysis. An analysis of variance conducted on the informational loss scores, derived by subtracting the delayed test scores from the immediate test scores, indicated that significant differences existed on four of five evaluative measures. Analysis of the differences between pairs of treatment means, via Tukey's WSD-Procedure, indicated generally that information loss for treatment conditions varied significantly for different cueing techniques and for different educational tasks.

Conclusions

(1) Results indicated that the amount of student achievement attributable to differing cueing technique (color & black/white) varies significantly in immediate testing for different educational tasks. Analysis generally favored the black/white treatment condition.

(2) There appears to be no significant achievement difference attributable to cueing technique at a two week delayed test analysis for different educational tasks.

(3) Mean treatment scores reflected a trend that by altering a conditioned cueing technique in delayed evaluative testing, the loss of student achievement is appreciable for different educational tasks.

(4) A significant mean difference was found among treatment conditions in analysis of the retentional value of cueing technique. Significance was interpreted as having originated due to different post instruction achievement, as reflected by immediate test analysis, rather than attributable directly to a particular cueing technique.

Abstract 13

WHEN CHILDREN VIEW TELEVISED VIOLENCE: SOME EFFECTS ON ATTITUDES AND EMOTIONS

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Purpose

This study is designed to (1) validate a scale for the diagnosis and study of children's attitudes toward the use of aggression in social settings, (2) test for sex differences in aggressive predispositions, (3) analyze the association of such predispositions with patterns of media use, particularly involving a high-saturation media diet of violence, and (4) to analyze physiological response (using polygraph measurements) of children while actually viewing scenes of varying violence content selected from current commercial television.

Rationale

Albert Bandura's social learning theory holds that people tend to emulate those models of behavior that appear effective (i.e., are reinforced). More specifically, he proposes that contemporary televised violence provides behavior models that will increase the development of favorable attitudes toward such acts. Feshbach argues that individuals with a lack of empathy and tendency to think stereotypically are more likely to condone violence as a social solution. This study investigates whether such effects actually occur in an experimental situation. Using an especially prepared scale of "violence-acceptance" and the experimental presentation of videotaped violent/aggressive scenes from commercial television allows a test of whether (1) such modeling is accompanied by emotional reactivity (measured by polygraph), and (2) whether violence viewing is related to predispositions toward aggressive social behavior.

Procedure

The CF scale, originally designed by Lovibond for an Australian population, has been extensively modified and subjected to validation using over 100 9th grade students. Likert-style scoring and item analysis were employed, including item-battery correlation and inter-quartile discrimination tests.

In the experimental portion of the project videotaped segments from commercial television are presented to 11-14 year old children in a laboratory in which both questionnaire and physiological measurements are taken. A 5-channel polygraph is used to measure emotional arousal with galvanic skin response, heart rate changes, respiration, blood volume and pulse.

Results

A CF scale with acceptable reliability is constructed from 19 items with 7 subscales representing "cynicism," "aggression," "sexism," etc. The scale correlates moderately with an index of violence viewing. T-tests across sex indicate significant differences in male and female attitudes toward violence and in the relationship between TV viewing and those attitudes.

In the psychophysiological portion of the research, there is preliminary evidence that low and high violence acceptance are related to different arousal patterns. Both groups tend to show galvanic skin reactance to violent segments; however, low-acceptors tend to show heart-rate acceleration while high acceptors tend to show heart-rate deceleration. There is much variability related to sex, though, and individual variations are also great. Therefore, continued refinement and larger numbers of subjects will be necessary to establish whether this relationship is valid.

The CF scale is potentially a useful diagnostic and research tool for the study of violence-acceptance among 11-14 year old children, and it can serve to index change toward aggressive behavior induced by media presentation of instructional programs. Preliminary use indicates that high violence viewing is somewhat associated with acceptance of violence and with lack of empathy. Differential physiological arousal appears to be associated with violence viewing, but more study will be necessary to establish the relationship with any certainty.

Abstract 14

A COMPARISON OF MULTIPLE AND LINEAR IMAGE PRESENTATIONS OF A COMPARATIVE VISUAL LOCATION TASK TO VISUAL AND HAPTIC COLLEGE STUDENTS

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One of the advantages of multiple imagery in an instructional tool is theorized to be that it allows images to be viewed simultaneously rather than sequentially. This should make learning tasks requiring comparison of visual cues easier for most students, but it should be of special benefit to individuals of the haptic perceptual type. Two perceptual types have been identified: the visual, who perceives visual detail easily and can mentally maintain visual images; and the haptic, who has difficulty doing both of those things. It is theorized that the simultaneity of images which is possible with multiple images is of particular benefit to haptics. Simultaneity should accomplish *supplantation*, which is accomplished when a process is performed explicitly for a learner which he is unable to perform for himself. The use of multiple images should supplant the mental retention of visual images which would be necessary if sequential (linear) images were presented and which haptics have difficulty doing. The result should be improved performance on a task requiring apprehension, retention, comparison, and utilization of visual cues.

Procedures and Results

An experimental task was designed which required S to view ten sets of three slides of unfamiliar pieces of equipment. These were a close-up of a specific item on the equipment marked with a red arrow, a medium shot, and an over-all shot. S was then given a photograph of the equipment and asked to locate the item which had been marked in the first slide.

Fifty undergraduates were tested with three instruments designed to measure perceptual type. Twenty-three visuals and twelve haptics were identified. Random selection and assignment were used to form two experimental groups (E_1 and E_2) of five visuals and five haptics. E_1 was given the experimental task with a linear image presentation. E_2 was given a multiple image presentation of the task. Mean response latencies and number of correct responses were recorded for all Ss. One- and two-way analyses of variance were used to compare scores and latencies between and within groups.

A 2 x 2 ANOVA revealed that visuals made higher scores than haptics ($F=6.164$, $df=1,16$, $p=.025$, $\omega^2=.18$) and that multiple image presentation was superior to linear ($F=12.082$, $df=1,16$, $p<.005$, $\omega^2=.35$). No interaction was present ($F=<1$, $df=1,16$). A one-way ANOVA on the scores of haptics under the two presentations was significant ($F=7.682$, $df=1,8$, $p=<.025$, $\omega^2=.49$), which suggests that the multiple presentation did perform supplantation.

A second 2 x 2 ANOVA revealed that visuals did not have significantly smaller mean latencies than haptics ($F=2.112$, $df=1,16$, $p>.10$) and that no interaction was present ($F=<1$, $df=1,16$). Latencies were generally lower, however, under the multiple presentation ($F=9.685$, $df=1,16$, $p<.025$, $\omega^2=.34$). Principal gains were made by the haptics, indicating the presence of supplantation. Comparison of the two haptic groups was significant ($F=5.742$, $df=1,8$, $p<.05$, $\omega^2=.42$).

Conclusions

The findings indicate that on a task requiring apprehension and utilization of visual cues, 1) visuals perform better than haptics, 2) multiple image presentation results in better performance than linear presentation, 3) haptics benefit more than visuals from multiple presentation, and 4) multiple presentation supplants retention of visual image.

It is suggested that further research be conducted on relationships between perceptual type, psychological demands of tasks, and supplantations possible with multiple imagery. It is possible that such presentations can compensate for more than one aptitude on which haptics—approximately one student in four—are weak. This could result in important new emphases in media utilization.

Abstract 15

DESIGN OF MULTI-IMAGE INSTRUCTIONAL PRESENTATIONS

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Purpose

The development of sophisticated media programming equipment has given educators the capability of presenting information to students in complex visual and aural formats. While "multi-image" or "multi-media" presentations are becoming more popular, there has not been extensive research into the ways in which multiple images differ from single images in terms of affective and cognitive learning.

Intuitively, a multi-image presentation would appear to have two potential teaching advantages over a single image presentation. One is the ability to increase the *amount of time* a visual is left on the screen. With visuals changing at the same rate as in a single image presentation, a multiple image presentation permits viewing a previous visual on the screen while adding a new one. The second apparent advantage is the ability to reinforce conceptual relationships which have been expressed verbally by physically juxtaposing pertinent visuals. This investigation studied these two variables to discover if they did, indeed, effect cognitive and affective learning results.

Procedures

Three treatments of a single subject were designed. Each had identical verbal content (narration on tape), identical visuals (word slides and pictures), and identical timing for the changing of visuals (one at a time in all three). The first treatment used a single projector, and the second and third used three projectors. In the second three screen treatment, the visuals changed, in succession from left to right. In the third three screen treatment, the screens were used to outline the subject material. Although only one slide was added at a time, it was placed in logical sequence with the material already presented. Opaque slides were used to eliminate images that were no longer relevant to the material shown.

It was felt that the second multi-image presentation emphasized the time variable, while the third multi-image presentation included the advantage of time, but emphasized the advantage of juxtaposition for conceptual reinforcement. The presentation involved simple word slides and black and white photographic slides illustrating non-verbal behavior.

Conclusions

The results demonstrated significant increased learning by subjects viewing the conceptually organized multi-image treatment compared to the left to right sequentially organized treatment. This finding is of considerable importance since the visual material was actually in view longer on the left to right treatment. It can be summarized that format design for multi-image presentations should consider conceptual relation of the material in view rather than filling three screens with visual information.

There was no significant direction indicated between the single and multi-image treatments from the results of this investigation. There are many additional variants that still need to be investigated to clearly formulate the interrelationship of these formats.

The ratings of the semantic differential revealed that presentations had approximately equal interest value, although the "aesthetic" appeal was not too strong. The subjects felt the presentations were well organized and clearly presented. The content was generally acceptable to the study samples

Abstract 16

GUIDED INDIVIDUAL STUDY USING TELEVISION

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Over the past several years the course, "Psychology: Behavior in Industry," has been taught to sections of 30 students, using a conventional lecture/discussion format. Recently, parts of the sections were limited to 15 students to provide for the individual needs of students through Guided Individual Study. The new format proved very popular with students and enrollments nearly doubled. This presented a problem since there was only one instructor, and it was not possible to obtain another to teach a second section.

To meet the needs of an increasing number of students without sacrificing the small group concept or increasing costs, instructional television was used as a major component of instruction. It was used to deliver the informational component of the course, thus leaving more time for class discussion and individualized instruction

At the end of the course the effectiveness of this form of instruction was evaluated in terms of students' attitudes and academic achievement, and in terms of dollar costs.

The results indicated that the students were very receptive to this new approach to instruction. having rated all the components of instruction high. Academic achievement in the section utilizing television was equal to, or greater than, academic achievement in sections utilizing a lecture/discussion method. The additional costs required to use television, especially when amortized over 3 uses of the video tapes. not only reduced instructional costs, but also allowed more time for individualized instruction by the teacher.

Abstract 17

THE EFFECTS OF PROJECTION VARIABLES ON PERFORMANCE IN A VISUAL DISCRIMINATION TASK

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Purpose

The purpose of the study was to examine the major effects and interactions of selected projection variables (viewing angle, image size, and contrast) on performance (accuracy and response time) in a projected visual discrimination task.

Rationale

Environmental factors, specifically aspects of the projected visual environment, are a major area of concern to the media field. However, an examination of published standards and research findings, as well as current classroom practices, shows that there is widespread disagreement on what should be the proper level of such factors.

A model of the interactions of the general and task environments with task, subject, and stimulus characteristics enabled the identification of 16 variables which might affect performance. Further refinement of the model led to the selection of the independent variables to be examined in the study

Procedures

The study employed a "Treatments x Treatments x Treatments x Subjects" design with repeated, random measures. The experimental task was to match one of two visual patterns with a third pattern, all of which were presented simultaneously. There were twenty-four variations of the basic pattern. Three levels of image size, three levels of contrast, and nine different horizontal viewing angles were established. A set of stimulus slides, which embodied all combinations of image size and contrast for each of the 24 pattern variations, was presented in random order to each of the subjects at each of the nine viewing angles The subject population consisted of nine graduate students who were paid to participate in the study Measures were taken of both error rate and reaction time for each of the stimulus items presented to each subject at each viewing angle. A total of 17,496 measures (24 patterns x 3 levels of image size x 3 levels of contrast x 9 viewing angles x 9 subjects) were taken for each of the two dependent variables. Physical controls were established for such environmental factors as temperature, noise, ambient light, etc., while the research design controlled for variation due to differences in visual acuity, etc., of the subjects.

Results

All main effects and interactions of the independent variables were found to be significant, the null hypothesis being rejected at the .01 level of confidence in all cases. Multiple range tests established an optimal viewing area for rear projected materials of 15° to either side of a line perpendicular to the screen on the basis of mean response time and of 30° to either side of the perpendicular on the basis of mean error rate.

Conclusions

The results allow one to state that performance in a projected visual discrimination task appears to be affected by viewing angle, image size, and contrast—the effect of these factors occurring both separately and in combination, and provides support for the following research hypotheses:

(1) Performance, as measured by both reaction time and error rate, will increase as image size is increased.

(2) Performance, as measured by both reaction time and error rate, will increase as contrast is increased.

(3) Performance, as measured by both reaction time and error rate, will *decrease* as viewing angle is increased.

(4) Image size will have its maximum positive effect when its level is maximum, viewing angle is at its maximum, and contrast is at its minimum.

(5) Contrast will have its maximum positive effect when its level is maximum, viewing angle is at its maximum, and image size is at its minimum.

(6) Viewing angle will have its maximum *negative* effect when its degree is maximum, contrast is at its maximum, and image size is at its minimum.

Abstract 18

THE RELATIONSHIP OF PERCEPTUAL TYPE TO PERCEPTUAL STYLE AND TEMPO IN COLLEGE STUDENTS

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Tests designed to test perceptual style (field-independent/field-dependent) and perceptual tempo (reflective/impulsive) are tests which require discrimination of visual detail. They are presented visually via pictorial stimuli. It seems reasonable that performance on these tests may be affected by the factor of perceptual type. Two distinct perceptual types have been identified: the visual type, who relies on vision as his major sensory intermediary, "sees" experiences, and reacts to them objectively as a spectator; and the haptic type, who relies on kinesthetic impressions, "feels" experiences, and reacts to them emotionally and subjectively. The following theoretical distribution for perceptual types in any population has been developed: visual, 50%; indefinite, 25%; haptic, 25%.

Since the tasks used as tests of perceptual style and tempo are presented via visual stimuli, performance on them could be expected to be influenced by perceptual type. The visual type could be expected to discriminate visual detail and to react impersonally, thus testing out as field-independent and reflective. The theoretical distribution should therefore be present among field-independent and reflective populations. The haptic type could be expected to be unable to discriminate visual detail and to react emotionally, thus testing out as field-dependent and impulsive. The theoretical distribution should therefore not be present among field-dependent and impulsive populations. These expectations would be consistent with models of cognitive processes in which solutions generated by individuals are based on the manner in which they encode stimuli.

Procedures and Results

Thirty-two undergraduates were given the Hidden Figures Test (HFT), Matching Familiar Figures (MFF), and Successive Perception Test I (SPT1). Perceptual style, tempo, and type groups were identified from these tests respectively.

It was first verified that the obtained distribution of perceptual types was not significantly different from the theoretical one ($X^2=.75$, df=2, $.50<p<.70$). The obtained distributions of visuals, haptics, and indefinites among the field-independent, field-dependent, reflective, and impulsive groups were then tested against the theoretical distribution with Kolmogorov-Smirnov one-sample goodness of fit tests. The critical value of *D* was read from a table with the Smirnov adjustment for directional hypotheses. The number of errors made by visuals and haptics on the MFF were compared with the Mann-Whitney U test.

The obtained and expected distributions of perceptual types were not significantly different among field-independents ($D=.1667$, $p>.10$) and reflectives ($D=.0625$, $p>.25$). The obtained and expected distributions were significantly different among field-dependents ($D=.40$, $p<.05$) and closely approached being significantly different among impulsives ($D=.2857$, $.05<p<.10$). An approximation of the theoretical distribution (2:1:1 ratio of visuals, haptics, and indefinites) was therefore present among field-independents and reflectives, but not among field-dependents or impulsives. The haptics, in addition to tending to be impulsive (70%), also made more errors on MFF ($U=38$, $p<.05$) than the visuals.

Conclusions

The results suggest the following general trends for visual tests of perceptual style and tempo:

1. Visuals tend to be field-independent and reflective.
2. Haptics tend to be field-dependent and impulsive.
3. Haptics tend to make more errors on a visual test of tempo.

It is suggested that further research be conducted to see if these trends appear in other samples. If

consistent relationships are shown to exist between perceptual type and performance on certain kinds of visual tests and stimuli presentations, the implications are important for the field of visual testing and teaching. As many as one-fourth of subjects and students may be inherently unable to perform certain types of visual tasks presented via visual stimuli.

Abstract 19

THE EFFECT OF GROUP DISCUSSION ON EDUCATIONAL RISK TAKING

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Purpose

The purpose of this study was to investigate the effect of group discussion on educational risk taking among teachers, as compared with teachers acting individually. Subjects were asked to respond to hypothetical situations, designed to measure an attitudinal dimension of risk taking. Three separate instruments were employed: the Educational Choice Dilemmas, the Intentionality Scale, and the Attitude Scale, in order to provide a framework for convergent validation.

Rationale

The study was based on the social psychological research into the "risky shift phenomenon," which holds that individuals tend to take more risky stances on issues after group discussion. It was hypothesized that this phenomenon could be directly applicable to the problems of inducing change and encouraging innovativeness in the notoriously conservative educational organization.

Research evidence led to the belief that group discussion of risky educational situations would shift subject responses concerning those situations in the direction of greater risk taking.

Experimental Design and Procedures

A posttest-only, control design was used in the study. There were three treatment groups and one control group. Each treatment group discussed the ten items (five judged to be moderately risky and five of low risk) comprising one of the three experimental instruments; however, all subjects responded individually to each of the three scales (all thirty items).

The experimental instruments had been carefully developed through preliminary surveys, and validated by subjects similar to those in the experiment. A tricomponential definition of risk taking was used for classifying scale items according to their perceived riskiness: beneficiality, difficulty, and uncertainty.

Subjects were principally chapter presidents of the California Teachers Association, who were voluntarily attending media workshops.

Principal Findings

Subjects who participated in group discussions had significantly lower scores on all scales (indicating more favorable attitudes towards risk taking in educational situations) at the .01 level of significance. This result was consistently found on both items discussed and those not discussed, when compared with the no discussion control group. The difference (in the direction of greater risk taking) between treatment groups and the control group, on the scale item specifically discussed, was termed the "main effect risky shift"; and the difference between treatment groups and control group on items not discussed was termed the "transfer effect risky shift." The magnitude of the shifts did not seem to depend upon item riskiness, nor did it relate to instrument characteristics.

The convergent validation of the different scales was not promising, indicating a lack of unidimensionality of the construct being measured. Split-half reliability coefficients were .76 for the Choice Dilemmas, .77 for the Intentionality Scale, and .59 for the Attitude Scale.

Conclusions

It was concluded that group discussion does have a profound effect upon attitudes towards risk taking in educational situations by those teachers used as subjects in the study. The effect does not appear to be limited to only items discussed, indicating the existence of a general risk taking construct. Additional research is recommended in the refinement of this important effect.

Abstract 20

BOOK-IN-MOTION/BOOK-IN-PRINT

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Purpose

This study compared cognitive learning of equivalent subject matter contained in two different formats: the videocassette and the book. Findings are related also to student scores in reading comprehension.

A subsidiary purpose of the study was to determine suitable logistics for utilizing the videocassette for total instruction.

Rationale

Development of THE ASCENT OF MAN from a series of films written and narrated by Jacob Bronowski to an illustrated book by the same author enables a direct comparison of the "book-in motion" (videocassette) and the "book-in-print" (textbook). The existence of essentially parallel content in print and nonprint formats provides a much better instrument for measuring relative effectiveness than was previously available.

Reduced cost and the improved operational capabilities of videocassette playback equipment now permit comparative evaluation of learning within a framework where the videocassette is competitive on a cost-per-student basis.

Research findings thus facilitated will supply information of value to curriculum planners and decision makers.

Procedures

A population of 250 students from three institutions of higher learning was randomly assigned to three treatment groups.

S_1 was given 45 minutes to view a video cassette selected from THE ASCENT OF MAN series, after which a 35-minute test was administered.

S_2 had 45 minutes to read the equivalent chapter from individual copies of the textbook, THE ASCENT OF MAN. The same test was given immediately following the reading period.

S_3 received no presentation of content from either videocassette or textbook, but the group took an identical test during 35 minutes of regular class time.

A 40-item test was developed after analysis of content as presented in both formats. Items were selected at several levels of the Bloom taxonomy (Cognitive). The test was validated using 85 students representative of the target population, after which the 35 most reliable items were selected for use in formal experimental study as a posttest. As noted above, the test required 35 minutes to administer.

Results

In each of the three test populations substantial learning occurred from the book and from the videocassette. Overall, there was a measurable but not significant advantage for the videocassette indicating this mode of learning was at least equal to the illustrated text. When compared with individual reading scores, there was a slightly larger but not significant advantage for the videocassette.

Conclusions

The researcher concluded that both methods were essentially equivalent for cognitive learning as measured by a multiple-choice test. The choice of methodology should therefore be based on logistics or the kind of learning experience which is required.

Abstract 21

SOME EFFECTS OF FIRST AND SECOND EDITIONS AND UTILIZATION PROCEDURES OF A FILM ON LEARNING AND ATTITUDES OF CERTAIN SEVENTH GRADE STUDENTS

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This study was undertaken in an attempt to determine what effect the such out-dated film visuals as fair styles, clothing styles, and classroom environment would have upon the cognitive and affective domans of seventh grade students after viewing out-dated and revised editions of the same instructional film. The specific concerns of this study were explored by the following null hypotheses:

1. There will be no significant difference between the learning measures among the participating students.
2. There will be no significant difference between attitude scale measures among the participating students comprising the same experimental groups.
3. There will be no significant correlation between cognitive and affective learning measures among the participating students comprising the same experimental groups.

One hundred and twenty-eight seventh grade students were randomly assigned to one of four groups of a posttest-only randomized control group design. The experiment was an integral part of their biology curriculum and completed within one regular fifty-minute class session.

The cognitive instrument consisted of twenty multiple-choice and five picture-completion items.

The affective instrument was a semantic differential scale of eight concepts and ten evaluative adjective-pairs.

Conclusions

1. Cognitive learning, in this experiment, was not significantly effected by a visually out-dated film.
2. Affective learning also was not significantly effected by a visually out-dated film.
3. No significant difference was noted among the three film treatment groups even when: (1) an announcement of the production date of the visually out-dated film; and (2) an additional statement which advised the students to overlook the out-datedness in the film were made.
4. There was no significant correlation between the students' cognitive score and their affective score.
5. The general conclusion from this study is that out-dated film visuals do not inhibit cognitive and affective learning. An older film was as effective as its revised counterpart.

Abstract 22

MORE THAN MEETS THE EYE: DISCREPANCIES IN COGNITIVE AND AFFECTIVE ADULT STUDENTS' RESPONSES TO TWO TELEVISION PRODUCTION STYLES

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Purpose

The resurgence of interest in instructional television (ITV) has brought renewed conflicts over the choice of production styles. The purpose of this study was to determine which of two representative programs employing two different styles in a semester-long course for open broadcast TV College (TVC) adult students was more successful in meeting: (1) the cognitive learning needs of the credit-seeking students, and (2) their need for viewing satisfaction while watching the telelessons. Specifically, the telephone interviews attempted to determine:

1. Which of the two programs provided more cognitive gain?
2. Which format was more attractive to the students and therefore more liable to hold their attention?
3. Which format would the students prefer to have as an instructional television style?

Rationale

Little evaluation of production styles has been conducted with open ITV broadcast, non-traditional adult college students enrolled in actual courses. Yet ITV decisions are now often based upon the highly embellished "Sesame Street" model or other models which may or may not be appropriate for adult credit students who are evaluated on complex issues which form program content.

Procedure

TV College used the $1.1 million series "Man and Environment" (M&E) as part of a 3-credit course in the Fall and Spring of 1973-74. The production format was documentary film style.

After each lesson shown from the M&E series, TVC broadcast its own program which was produced in the inexpensive host-guest format using a limbo set in a television studio. Guests occasionally brought 35 mm slides produced by themselves. An interview protocol was developed with a focus on a set of these programs which asked the student to recall main themes, visual images and sequences, ideas and concepts associated with these images, cumulative feelings about the two kinds of format they felt they learned more from, etc. Responses were content analyzed from audio tapes of the interviews.

The final sample was 36 out of an initial random sample of 60 students from a course enrollment of 361. The profile was typical of TVC students: average age 31 years, 53% female, 60% working full or part time, average of 30 semester hours of college studies, half enrolled concurrently in conventional classes, half in TVC only.

Results

Cognitive gain was higher with the target TVC program than with the M&E series. None of the students were able to give the main theme or approximation of it for the M&E (vs. 74% for the TVC

program). No spoken lines were recalled from the M&E (vs. 28% for TVC). While number of images recalled was greater with M&E, ideas and concepts associated with the images were recalled more accurately from the TVC program. 67% voted for a combination of the two formats rather than one only type of style.

Conclusions

Production style for adult credit students should contain direct teaching, enhanced by interesting film clips in a "checkerboard" style in order to meet both cognitive and affective needs. Highly embellished styles may not be appropriate for effective cognitive learning when weighed against the high costs of such efforts.

Abstract 23

THE DEVELOPMENT OF MASS-MEDIA PROGRAMS AT BERGEN COMMUNITY COLLEGE– AN ANALYSIS OF METHODOLOGY AND INSTRUCTIONAL DEVELOPMENT

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This paper examines the nature of the community college and the development of teaching methods which exemplify its broad functions. The role of Bergen Community College in Paramus, New Jersey, is examined, with its emphasis on community services, the development of media as teaching tools, and the utilization of mass media programming to reach an untapped student and adult population.

The report reviews the production of six radio and television series developed by Bergen Community College and presentation over local and national radio and television networks. Examples of these public programs are the 10 program-TV servies, "The American Suburbs: Myth and Reality," produced for NBC-TV in 1973, and the 54 program television series, "The American Presidency–The Men and the Office," produced for CBS-TV, 1973. This series was utilized as an undergraduate history course.

Dr. Philip C. Dolce, Coordinator of Public Media Programming at Bergen Community College, produced these radio and television series, and developed the technique of using radio programs as a pilot for production of a television series. For example, the radio series "Pinnacle of Power: The United States Presidency," became the basis for the television series, "The American Presidency: The Men and the Office."

Concluding this paper an attempt was made to obtain some perspective and to evaluate the mass media programs and credit courses developed at Bergen Community College. The assessment of effectiveness was approached from the perspective of the purposes of the community college. Videotapes and audiotapes of all programs were made by the staff of the Library and Learning Resources Center and were available for evaluation. In addition, taped interviews were made of the College's administrators, and the professors who taught and designed the classes. Selections of the videotapes will be available at the presentation of this paper at the AECT convention, Dallas, 1975.

The results of this research indicate that the estimated audience was one to two million persons. Over 700 letters were received, from 44 states; the majority of the letters indicated strong praise for the series, with frequent requests for additional materials, and/or course descriptions. Students enrolled in the course were equally enthusiastic. CBS subsequently contracted for another 54 program series, entitled, "Science and Society–A Humanistic View;" this interdisciplinary course will be presented from May–September 1975. This report will attempt to analyze the instructional development of these media productions.

Abstract 24

THE EFFECT ON ACHIEVEMENT AS INFLUENCED BY THE RELATIONSHIP BETWEEN THE INDIVIDUAL'S COGNITIVE STYLE AND INSTRUCTIONAL MODE

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Purpose of the Study

This investigation had a three-fold purpose: (1) to diagnose each student's abilities and preferences in reading printed material and listening to recorded audio material, (2) to make a random assignment of the Ss to a reading experience or to a listening experience, and (3) to test the effects and interactions of matching reading and listening ability and reading and listening preference with the instructional modes of reading and listening on the basis of achievement in informational content.

Rationale

This study attempted to provide a systematic, concrete, and practical procedure by which a media specialist or teacher could give knowledgeable personal service in reading and listening to individual students on the basis of each student's special needs, characteristics, and interests and thus match a learner with the most suitable learning materials.

Accordingly, one null hypothesis was formulated, namely the following: there are no effects on achievement attributable to *ability* in reading or in listening, to *preference* for reading or for listening, or to the *combined* influences or interactions of reading ability and reading preference or listening ability and listening preference when achievement in informational content is measured by a post-test following a reading experience or a listening experience.

Procedures

Three instruments were administered to Juniors and Sophomores: (1) the *Nelson-Denny Reading Test;* (2) the *Sequential Tests of Educational Progress: Listening;* and (3) the *Materials Preference Survey,* designed specifically for this study, as a measure of reading preference and listening preference.

These tests placed the Ss in eight cognitive style categories. Ten Ss were randomly assigned from each of the categories to a reading experience, a listening experience, or a post-test only control group. This provided a total of 160 treatment Ss and twenty-four post-test only control group Ss. Following a presentation by means of a printed script or tape-recorded narration, a post-test on the informational content of the presentation was administered.

Results

A *t* test showed significant differences: (1) between the 160 treatment Ss and the post-test only control group Ss (12.51 at .01), (2) between the high reading ability group vs. the low reading ability group (4.65 at .01), (3) between the high listening ability group vs. the low listening ability group (3.03 at .01), and (4) between the high reading ability and high reading preference group vs. the low reading ability and low reading preference group (3.05 at .01).

In the factorial analysis of variance, statistical significance was indicated in two main effects, that is, between modes (9.66 at .01) and between abilities (70.20 at .01). Neither the *t* test nor the analysis of variance revealed any statistical differences in the analysis of preferences.

Conclusions

The following conclusions were made: (1) On the basis of the instruments used in this study a valid and predictive diagnosis of cognitive style was not established. (2) On the basis of the preference instrument used in this study, an individual's preference for reading or for listening did not measurably effect achievement. (3) High ability, either in reading or in listening, was the strongest

decisive factor in a student's achievement. (4) The reading mode had a greater effect upon achievement than the listening mode. More research still needs to be done to determine the viability of cognitive style as a construct in a student's use of the many modes of learning.

Abstract 25

THE EFFECT OF INSTRUCTIONAL CUES ON NON-VERBAL LEARNING

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An instructional cue is the minimal informational stimulus needed to enable a learner to emit or acquire a response of interest. Research was conducted to determine whether or not instructional cues designed on the basis of a model developed in an earlier study in this series would have a facilitating effect on the learning of complex psychomotor tasks in a simulator. Since instructional cues facilitate cognitive learning and since cognitive pretraining facilitates complex perceptual motor learning, we hypothesized that instructional cues will facilitate complex perceptual motor learning. Eleven USAF undergraduate pilot trainees received instructions containing three levels of the independent variable (instructional cues) while learning how to fly an instrument maneuver in a simulator. The results, expressed in six measures of performance quality, indicated that students receiving systematically-generated instructional cues exhibited superior performances. We concluded, therefore, that the conceptual framework used to design instruction in this experiment is applicable to psychomotor learning tasks.

Abstract 26

MEASURING PROGRAM ACCEPTANCE

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This presentation reviews the possibility of a concept of ACCEPTANCE as an effective response to media, suggests how it might be measured, and offers inferences for indicating mediation effects in addition to or contrasted with cognitive learning.

The major thrust of the implementation of instructional uses of media and materials has been the measurement of cognition as an indicator of learning from the particular media in the form of recalling facts and concepts, usually in verbal formats, i.e. multiple choice questions. Recent concern has been focused on a much broadened effect of using media and materials in instruction. The investigation of affective domain items such as attention, attitudes, interests, etc. in connection with the use of media and materials suggests that there are differential responses in this domain and that those responses may negate, parallel, and/or enhance cognitive responses.

Acceptance studies collect, analyze, and interpret data concerning overt acts and expressed opinions indicating agreement or approval by individuals, groups, agencies or institutions of the hardware, support services, and courseware of a media or materials effort.

The function of the information derived from the acceptance concept is to help future decision makers consider, plan, and promote projects and educational activities based upon a firm data base of affective as well as cognitive information.

Acceptance has two forms: behavioral and opinion.

Behavioral indicators of acceptance were gathered by self-report methods, on the assumption that an individual's voluntary allocation of time to activities represents *tacit acceptance* of that activity The time spent on required activities is used as an indication of *implicit acceptance*, and those who express opinions which indicate a higher level of acceptance voluntarily spend more time in required activities.

Opinion indicators of acceptance are those subjective responses to actual objects identified as making up the parts of the media or material. For example, these would include the hardware, various support services and objects, and program segments.

Findings

The daily response data from students and teachers has clearly indicated acceptance of some program segments and the rejection of other segments. Revisions of the low-rated segments received a higher acceptance rating when presented to later groups.

Opinion acceptance items clearly support specific parts of the demonstration and reject others. These opinion items also reflect the observed behavioral indicators of time allocations of teachers and other school staff members. Varying the program quality results in a corresponding raising or lowering of opinion judgements.

One must conclude that acceptance information is measurable, indicates direction of affect, and estimates behavioral time allocation for specific and voluntary tasks. There may also be a relationship to the resulting cognitive output of viewers. This latter relationship will be reported later.

Abstract 27

AN INVESTIGATION OF THE EFFECTIVENESS OF REALISTIC AND NON-REALISTIC COLOR IN VISUALIZED INSTRUCTION

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Purpose

The purpose of this study was to determine the relative instructional effectiveness of two forms of color cueing in visual instructional materials. Both immediate and delayed retention effects were examined.

Rationale

An ongoing controversy exists with regard to the role of realism in visual materials. One theoretical orientation suggests that the more realistic an instructional device, the more effectively it will facilitate instruction. A conflicting group of theorists describe the human formation processing system as being of limited capacity; which, in times of high information input may become overloaded and possibly block a portion of the information.

In studies related to the use of color in visual materials, similar conflicting results have been reported. As a result, few guidelines have been forthcoming relative to the use of color in visualized material for instruction. Consequently selection and utilization are determined primarily by two, non-instructional factors: the greater aesthetic appeal of color and the relatively high production cost of color materials.

It was the primary objective of this study to use variations in color cue realism as a method whereby the realism and color vs. black and white controversies could be further resolved.

Procedure

The materials used in this investigation consisted of six instructional programs on the parts and functions of the human heart, presented by means of audio tape and slides. Each of these programs contained a series of visuals intended to complement the same oral script. Two sets of visuals were prepared in realistic color and two sets were produced in non-realistic color by means of photographic reversal. The remaining two sets were prepared in black and white and non-illustrated formats, respectively. Photographic reversal was used as a means of producing visual materials in which the total number of visual cues were held constant while the color of the visual (realistic or non-realistic) could be modified.

The data for this study was obtained from 224 college students enrolled in the basic Instructional Media course at the Pennsylvania State University. All subjects were pretested with a standardized mental ability test as well as a general test in the content area. S's were assigned to one of six treatment groups. These groups represented (1) non-illustrated; (2) black and white shaded drawings: (3&5) realistic color drawings; (4&6) non-realistic color drawings.

Measurement of achievement was accomplished by the use of five tests designed to measure achievement of different educational objectives. All achievement tests were administered both immediately following instruction and at a time six weeks later.

Statistical analysis was conducted by the use of analysis of co-variance procedures when two pretest measures were significantly correlated with the criterion variables. In all other cases, analysis of variance techniques were used. When significant F-values ($p<.05$) were found, the Tukey WSD Test was used on all pair-wise comparisons.

Results

Of the ten F-ratios computed, four on the immediate tests were found to be significant at the .05 level. None were significant on the delayed (6 week) tests.

Conclusions

Three conclusions were drawn from the data analysis in this investigation:

(1) Different types of color cueing devices with similar degrees of visual complexity are not equally effective in aiding learner achievement.

(2) In those cases where visual materials were significantly more effective than instruction without visuals, realistic color cued visuals were superior in facilitating student achievement.

(3) Although realistic color visuals facilitated immediate retention of material, these effects disappeared after two weeks.

Based on these findings, it would appear that the increased effectiveness of the realistic color materials was due to the factor of realism rather than the greater number of available visual cues.

Abstract 28

A STUDY OF THE EFFECTIVENESS OF THREE VISUAL ATTENTION-DIRECTING DEVICES ON THE RECALL OF RELEVANT INFORMATION FROM LINE DRAWINGS

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The purpose of this study was to evaluate the effectiveness of visual attention-directing devices used to aid first- and fourth-grade learners in locating and responding to specific portions of pictures. This was accomplished by comparing the responses of a control group, which received an auditory/visual stimulus without visual cues, to three experimental groups. The three experimental groups received the identical auditory/visual stimulus package with the following cueing variations. For one experimental group, visuals were cued by a small arrow. Another group had visuals cued by a larger arrow. The third experimental group's visuals were cued with a pointer.

The four treatments were administered to 128 first-grade and 104 fourth-grade subjects through a set of four overhead-projected transparencies with accompanying audio-taped directions. Each transparency contained three similar line drawings. The drawings were (1) three pieces of fruit; (2) three dogs; (3) three fish; and (4) three birds.

A mixed, Type II design (Lindquist, 1953) allowed for the assignment and administration of the four treatments with the four transparencies. A predetermined .05 α was selected. Data was gathered and analyzed for each grade level based on correct (1) or incorrect (0) scoring criteria. The response was considered correct if Ss marked the specified part on a drawing. All other marking variations were considered incorrect.

For fourth-graders, all cueing methods effectively aided subjects in locating and marking specific portions of the line drawings. The addition of visual attention-directing devices did not appear to influence the subjects in the completion of the response tasks.

The first-graders did not perform as well as fourth-graders on the tasks. However, differences in subjects' performances were found. Differences were found between: auditory cueing alone and small cueing arrow ($p<.02$); auditory cueing alone and larger cueing arrow ($p<.01$); auditory cueing alone and pointer ($p<.001$); small cueing arrow and larger cueing arrow ($p<.85$); small cueing arrow and pointer ($p<.02$); and, larger cueing arrow and pointer ($p<.04$). A rank ordering of the treatments (least effective to most effective) for first-grade subjects was: auditory cueing alone, cueing arrows, and pointer.

It was concluded that the addition of visual attention-directing devices (arrows and pointers) to line drawings will not necessarily have any effect upon fourth-graders' performance in locating and marking instructionally important parts of line drawings when clear, precise auditory cues are given.

The addition of visual attention-directing devices to line drawings can increase first-grade students' performance in locating and marking instructionally important parts of the drawings even when clear, precise auditory cues are provided.

Abstract 29

STUDENT PERFORMANCE IN A MODULARIZED HUMAN ANATOMY AND PHYSIOLOGY COURSE

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A course in human anatomy and physiology utilizing a modular approach was begun at the University of Arizona in the summer of 1970. Every effort was made to make the course as enjoyable and interesting as possible with the belief that this would aid in building student interest and motivation. Re-arranging topic sequences, actively soliciting student opinions, giving the course a small class atmosphere, as well as the modularization of the material itself, was done to combine a stimulating climate with a sincere commitment to improving the learner experience.

This particular study was conducted to determine if students in certain majors, age, sex, or ethnic groups, were more successful than others in the course. Moreover, comparisons were made with these identifiable groups of students and their achievement in the modularized science course, with their achievement in non-modularized science courses, as well as their cumulative GPA.

The grades earned by more than 3,000 students were among those analyzed for the study to be reported. As mentioned previously, the grades by these students in the modularized science course, non-modularized science courses, and the student's overall GPA, were all included and evaluated. Therefore, the data is statistically reliable in terms of numbers.

Certain majors and ethnic groups consistently scored higher in the modularized science course than did the other groups. Students tended to achieve at higher levels in the modularized science course than in non-modularized science courses and their level of achievement in the modularized science course very nearly approached the student's overall GPA. Sex had little correlation with achievement and correlations between age and achievement reflected increased maturity and experience.

It was concluded that for certain incoming minority students and for students in majors that had typically low scores in the past, the modularized approach used in this science course was a distinct improvement. Scores by the entire group under consideration in the modularized course raised after the material was converted to modules. Scores on nationally standardized exams in the subject matter area also reflected increased comprehension after modularization.

Abstract 30

THE EFFECTS OF INSTRUCTION AND PRACTICE IN AN EFFECTIVE INSTRUCTIONAL PROGRAM

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The purpose of the present study was to determine the individual and combined effects of instruction and practice on learner performance on a pictorial discrimination task. The study was conducted as part of a series of studies designed to determine which instructional variables contribute to *effective* instructional materials. In this study, effective instructional materials were defined as materials which enabled 80% of the learners who received the materials to correctly answer 80% of the items on a posttest.

Many studies are designed to determine whether one type of instructional material is better than another type of instructional material. However, one type of material might be significantly superior and still not be effective. The instructional material used in this study was developed, field tested, and revised until it was effective. Instructional variables within the material were then manipulated so as to determine which variables were contributing to the effectiveness of the material.

The instructional material used in this study was a self-instructional program designed to enable learners to identify which one of four illustrations of aircraft in flight most nearly represented the position indicated on an altitude indicator and a heading indicator. The program had been systematically developed to include instruction (instructional cues and examples), practice, feedback, and an incentive. In the present study, instruction and practice were manipulated to determine their contribution to learner performance.

Two levels of instruction (presence and absence) and two levels of practice (presence and absence) were manipulated in a 2 x 2 factorial design. Instruction was varied by deleting all instructional cues and examples from half of the programs. Practice was varied by deleting all practice items from half of the programs.

Subjects were 52 undergraduate students enrolled in an educational psychology course at Arizona State University. Subjects were randomly assigned to one of four treatment groups. The "instruction and practice" group received the instructional program with the instruction and the practice items intact. The "instruction only" group received the program with all the practice items deleted. The "practice only" group received the program with all the instruction deleted. The "control" group did not receive the instructional program, they only received a 36-item posttest. Subjects who received one of the forms of the instructional program were given the posttest immediately after they completed the program.

F-ratios were calculated for the posttest scores. The results revealed a statistically significant difference attributable to instruction ($p < .001$). The *F*-ratios for practice and for the interaction of practice and instruction were not statistically significant.

F-ratios were also calculated for posttest rates of responding. The differences in rates of responding did not approach statistical significance.

The results of this study indicate that instruction (instructional cues and examples) contributes greatly to the effectiveness of instructional materials. The results also indicate that when practice is combined with effective instruction, practice does not improve learner performance. If practice, when combined with effective instruction, does not improve learner performance, then the time learners spend completing practice exercises could be better spent receiving instruction on other skills. Future research should be conducted to determine whether practice does contribute to the effectiveness of *effective* instructional materials.

Abstract 31

DETERMINANTS OF LEARNED HELPLESSNESS IN PROBLEM SOLVING

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Despite support for the proposition that learning is enhanced by the reinforcement of correct responses, there remain learners who continue to fail when contingent reinforcement is administered, even though they may have the ability and be motivated to succeed. This condition, known as learned helplessness, presents a problem for instructional technology in that reinforcements, whether administered by a human teacher or a programmed format, do not strengthen a response.

Hence, it is presumed that additional knowledge about the development of learned helplessness will have implications for instructional designs aimed at alleviating the condition. In previous studies of this problem the instructions given the subjects (*Ss*) have contained cues which may have interacted with the actual reinforcement contingencies. In the present study an attempt was made to control for both instructions and reinforcement contingencies.

Each of 54 *Ss* was given a training task that involved using a manipulandum to attempt escape from an audible tone that was varied in amplitude from mild to aversive. The training task was followed by a transfer test at a second manipulandum in which the task was to escape or avoid an audible tone.

It was found ($p<.05$) that *Ss* who were unable to escape during the acquisition trials showed the greatest decrement in performance during the transfer test. Furthermore, instructions which correctly described the task and contingencies facilitated escape performance, but incorrect descriptions or no descriptions inhibited it. And, it was found that instructions interacted with the training task in such a way that only those *Ss* who could escape during the training task, and also were told that escape was possible, escaped in significantly less time than all other groups.

In conclusion, the present study demonstrated that in laboratory studies, both instructions and reinforcement contingencies contribute to the development of learned helplessness. This phenomenon has value in instructional technology because of its potential for contributing to a greater understanding of the etiology and treatment of chronic failure behavior which is independent of ability on the part of children in school.

Abstract 32

AN EXISTENTIAL APPROACH TO MULTI-MEDIA PROGRAMMING: A PILOT PROJECT IN CONTINUING EDUCATION

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Educational theory up to now is one of the few areas of inquiry that has not been influenced a great deal by existential-phenomenological concepts. Our educational theories (differential-theoretical) are still groping their way in contradictions and inconsistencies. With the frightening progressive "animalization" of man and the ever increasing humanization of the machine we seem to be living in an age of political collusion, environmental pollution and educational confusion.

More specifically, the authors examined the extent to which existentialism (multi-dimensional vision of man) could be experimentally operationalized into providing criteria for the selection of instructional strategies using multi-media programming. The project, designed and tested within the framework of an "off-campus" Master in Education degree programme, demonstrated that existentialism could provide the criteria for the selection of instructional strategies that integrate group learning, individualized learning, problem-solving, introspective and extrospective personalization. The exclusiveness of differential-theoretical models was avoided, and each dimension of man was exploited fully using the most effective instructional strategies possible. The authors developed a diagram which illustrates their approach.

Abstract 33

EFFECTS OF A ROLEPLAY/GAME ON PLAYERS' ATTITUDES TOWARD INSTRUCTIONAL GAMES

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Purpose

The study examined the effects of (a) the pretest as a sensitizing agent, (b) playing the game as a treatment, (c) the interaction of pretest with treatment, and (d) role assignment on players' attitude toward instructional games.

Rationale

Although earlier studies deal with the attitudinal effects of extended simulation games, very little work has been done on the use of single-shot, single-period exposures typical of the common classroom use. Further, both the message and medium used in this study involved instructional games. This enabled us to measure attitudinal shifts without contamination through different content.

Procedure

An expanded Solomon four-group design was used with a fifth group receiving a partial treatment. Following a brief introduction, subjects were asked to predict the group mean attitude toward the use of instructional games. The predictions were kept concealed. A 20-item Likert scale was administered to the subjects who were asked to respond to it on the basis of their individual feelings toward instructional games. On the basis of the arguments provided by the role sheet a series of debates ensued. During the roleplay, the attitude scales were scored and the actual mean was computed. The subject who had predicted closest to the actual mean was identified as the winner of the first phase of the game. Having discussed the topic more fully, subjects were asked to make a second prediction about the group's attitude toward instructional games. The predictions were again concealed. The same attitude scale was administered for a second time. During debriefing, the second set of attitude scales was scored to identify the new group mean and the second winner.

Results and Conclusions

1. A two-factor analysis of variance revealed no main effects and a significant interaction of pretesting with game playing, $F(1, 81) = 4.29$, $p < .05$.

2. A point biserial correlation of .44 was obtained between the player's role assignment (positive or negative) and their attitude shift (posttest score-pretest score). A t value of 2.24 indicated that the correlation coefficient was significantly different from chance alone at the .01 level.

Abstract 34

AN EXPLORATORY STUDY OF COGNITIVE STYLE AS A PREDICTOR OF LEARNING FROM SIMULATION GAMES

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Review of the Literature

An extensive probe of the research dealing with the effectiveness of simulation gaming revealed conflicting findings in terms of whether this instructional strategy motivates students, promotes the learning of factual information, and changes attitudes.

Problem

Edwards suggest that this state is due to the failure of researchers to consider learner characteristics as variables that mediate learning from simulation games. Therefore, the purpose of this exploratory study was to utilize the cognitive style theory of Hill to determine whether educational cognitive style is related to cognitive learning from simulation games.

Method

Since this was an exploratory study, it was determined that a small sample of twenty-four fifth graders could be used to gather data and formulate hypotheses concerning the question posed.

Subjects participated in the *Bow and Arrow Hunting Game* and the *Crossing Place Hunting Game*, two simulation games selected from the "Man: A Course of Study" curriculum.

To measure each subject's cognitive learning, a gain score of post-test minus pre-test was determined for each of the two simulation games. These two gain scores were averaged with a mean gain score being established for each subject.

The educational cognitive style of each subject was mapped using a test battery provided by Oakland Community College (Michigan).

Examination was made of the educational cognitive style maps associated with those subjects whose mean gain score fell within the top (achievement group) 25 percent of the sample.

Conclusion

Findings of the study led to the hypothesis predicting that students who derive maximum cognitive knowledge from simulation games are likely to be those who (1) gather a great deal of information from listening to others, (2) derive meaning from sounds, (3) empathize, (4) prefer peer-group interaction, (5) can but do not prefer to operate in independent study settings, and (6) reason to some degree through the application of rules and/or definitions.

Abstract 35

EFFECTS OF NARRATOR SEX ON PERCEPTION OF AUTOKINETIC MOVEMENT

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Problem

The long standing preference for male narrators does not appear to have a basis in research. The basic question is: are there measureable differences in credibility of maies and females as instructional narrators?

Hypothesis

There are no significant differences by sex of respondant, sex of narrator, or direct or indirect suggestion tape treatments in Ss reported perception of movement in an autokinetic device.

Design

Design was 2 (narrator sex) by 2 (sex of respondant) by 2 (direct or indirect suggestion). Autokinetic movement was chosen as the most reliable indicator of source credibility. Analysis was three-way ANOVA overall. Post hocs were two-way ANOVA by sex of respondant.

Subjects

64 Ss, 32 male and 32 female, randomly selected from upper elementary pupils at the University of Missouri-Columbia Laboratory School were randomly assigned by sex to each of the four treatments.

Experimental Task

S's task was to observe a point of light in a darkened room and to draw a line showing how much the light moved.

Materials

Four tape recorded sets of instructions were used as intervention materials: (1) Indirect Suggestion/Female Narrator, (2) Indirect Suggestion/Male Narrator, (3) Direct Suggestion/Female Narrator, and (4) Direct Suggestion/Male Narrator. Indirect Suggestion tapes told Ss only that the light *would* move. Direct Suggestion tapes told Ss how far the light *should* move.

Procedures

Ss reported to a windowless sealed room. The treatment tape was played while the room remained light. The room was then darkened for the 20 seconds during which the pinpoint light appeared. Room lights were then turned on again and Ss marked their response sheets. Responses were scored by measuring line length in 16ths of an inch.

Results

Summary three-way ANOVA (Table 1) reveals narrator sex as the significant (.05) main effect.

A significant (.05) interaction effect between narrator sex and sex of respondant is also revealed.

When means are compared by narrator sex and sex of respondant the compounding effect is clear. Female Ss response to male tapes was 66.75/16th inches vs. 19.62/16th inches for males responding to male tapes. Response to female tapes by females was 26.75/16th inches vs. 30.87/16th inches by males.

When data by sex of respondant are analyzed by two-way ANOVA, the major factor contributing to the interaction is clearly identified. Summary of ANOVA for female respondants reveals highly significant (.01) main effects for narrator sex. Summary ANOVA for male respondants reveals no significant main effects or interaction.

Discussion

These data indicate that for elementary school Ss, male narrators constitute a more credible source for instruction of females. Male Ss do not respond differently to male or female narrators.

Conclusion

1. Female elementary school subjects respond significantly more vigorously to instruction by male narrators than by female narrators.
2. Female elementary school subjects respond significantly more vigorously to male narrators than do male elementary school subjects.
3. Male elementary school subjects do not respond differently to male or female narrators.

TABLE I

SUMMARY ANOVA

Source	*Ss*	*df*	*MS*	*F.*
A Narrator Sex	1849.000	1	1849.000	7.07 *
B Sex of Respondant	826.562	1	826.562	3.159
C Suggestion	39.062	1	39.062	1
A x B	2626.563	1	2626.563	10.04 *
A x C	588.063	1	588.063	2.248
B x C	100.001	1	100.001	1
A x B x C	56.249	1	56.249	1
S/ABC	14650.500	56	261.616	.....
Total	20736.0	63	.....	.....

* exceeds critical value at .05

Abstract 36

COLLEGE PHYSICS: AN INSTRUCTIONAL DEVELOPMENT TREATMENT

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Purpose

The purpose of this project was to develop a fully mediated, individualized course that would be cost effective and demonstrate both affective enthusiasm and significant cognitive achievement by those students enrolled.

Rationale

Individualized instruction must be flexible in terms of time, content sequencing and mode of delivery for both students and the instructor. Working from this premise, we developed a voluntary, one-credit college level course in Physics Problem Solving that was fully mediated requiring no instructor present while enabling the students to attend and practice the application of principles learned to problems posed at their own convenience. The instructor was relieved of the more repetitive and mechanical aspects of teaching while his role changed to that of a tutor and counselor. He was able to be available as the students needed him and not as a clock ordered.

Procedures

Production began in the spring of 1973. The Philips/Norelco PIP machine was chosen as the hardware for the delivery system because of its versatility and the learner control it provides. It employs two cassettes: one for super 8mm film, and the other for audio tape. The audio tape carries both the narration and the synch pulses that control the playback of the film.

In the fall of 1973, approximately 180 students enrolled in the general introductory physics course. Of these, ninety elected to take the mediated one-credit problem solving course.

Student scores on exams were recorded and analyzed. Students filled out evaluation cards on each program. Based on this information, we developed a final evaluation to receive more feedback on the effect of the programs.

To establish the fiscal effectiveness of the project, we kept records of all development and production costs and amortized them over six semesters. We compared our costs with the traditional method of instruction based on faculty load and FTE's, and arrived through a complicated formula at a cost figure for both types of instruction.

Results

Results indicate ten raw score points higher than the means of the non-PIP group on Problem Test No. 1, indicating significance at the .001 level. The difference dropped on the second problem test, but was again significant at the .001 level on the third problem test. MLO exams scores showed no difference between the groups, as was expected. Both groups were compared for means on high school average, math, and verbal SAT scores. No difference was evident.

Through the use of the following formula, we were able to obtain a cost savings of $1,549.00 over conventional instruction.

Development Costs ÷ 6 Semester Amortization
\+ Operating Costs
\= Instructional Development Costs

*Conventional Costs	$5,400.00	*Conventional Costs = No of FTE's ÷ Average Faculty Load x Average Faculty Salary
– Instructional Development Cost	3,851.00	
= Total Savings Per Semester	$1,549.00	

Mean time spent compared with actual running times of programs showed that students were actually working out problems and not merely finding answers. Students liked the program for the following reasons: clarity and explanations, self-paced aspect, accessibility and availability. Students did not like the difficulty of the material, but found it helpful enough to recommend that this type of program be available in other courses.